

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A steel for a high bearing pressure-resistant member, having a high machinability, said steel being formed of a machine structural steel comprising carbon in an amount ranging from 0.15 to 0.25% by weight, silicon in an amount of not less than 0.4 % by weight and not more than 1.23 % by weight, nickel in an amount ranging from 1 to 3 % by weight, chromium in an amount ranging from 1.2 to 3.2 % by weight, and molybdenum in an amount ranging from 0.25 to 2.0 % by weight, a total amount of chromium and molybdenum amounting to at least 2.71% by weight, said machine structural steel containing carbide precipitated under a heat treatment for spheroidizing, the carbide having an average particle size of not larger than 1 μm and the maximum particle size of not larger than 3 μm , wherein said heat treatment includes maintaining said machine structural steel at a temperature ranging from 700 to 820 °C, and cooling said machine structural steel to a temperature of 600°C at a cooling rate of not higher than 20 °C per one hour.
2. (Original) A steel as claimed in Claim 1, wherein said carbide contains at least one carbide selected from the group consisting of MC carbide, M_2C carbide, M_7C_3 carbide, M_{23}C_6 carbide, and M_6C carbide.
3. (Original) A steel as claimed in Claim 1, wherein said machine structural steel has a Vickers hardness ranging from 180 to 250 after undergoing the spheroidizing heat treatment.
4. (Previously presented) A high bearing pressure-resistant member made of a steel which has a high machinability and is formed of a machine structural steel comprising carbon in an amount ranging from 0.15 to 0.25% by weight, silicon in an amount of not less than 0.4 % by weight and not more than 1.23 % by weight, nickel in an amount ranging from 1 to 3 % by weight, chromium in an amount ranging from 1.2 to 3.2 % by weight, and molybdenum in an amount ranging from 0.25 to 2.0 % by weight, a total amount of chromium and molybdenum amounting to at least 2.71% by weight, said machine structural

steel containing carbide precipitated under a heat treatment for spheroidizing, the carbide having an average particle size of not larger than 1 μm and the maximum particle size of not larger than 3 μm ,

wherein said machine structural steel undergoes one of a first treatment and a second treatment after the spheroidizing heat treatment, said first treatment including hardening the machine structural steel by carburizing, and tempering the hardened machine structural steel, said second treatment including hardening the machine structural steel by carbonitriding, and tempering the hardened machine structural steel, wherein said heat treatment for spheroidizing includes maintaining said machine structural steel at a temperature ranging from 700 to 820 $^{\circ}\text{C}$, and cooling said machine structural steel to a temperature of 600 $^{\circ}\text{C}$ at a cooling rate of not higher than 20 $^{\circ}\text{C}$ per one hour.

5. (Previously Presented) A method of producing a steel for a high bearing pressure-resistant member, having a high machinability, said method comprising:

preparing a machine structural steel comprising carbon in an amount ranging from 0.15 to 0.25% by weight, silicon in an amount of not less than 0.4 % by weight and not more than 1.23 % by weight, nickel in an amount ranging from 1 to 3 % by weight, chromium in an amount ranging from 1.2 to 3.2 % by weight, and molybdenum in an amount ranging from 0.25 to 2.0 % by weight, a total amount of chromium and molybdenum amounting to at least 2.71% by weight; and

applying a heat treatment for spheroidizing on said machine structural steel so that carbide is precipitated in said machine structural steel, the carbide having an average particle size of not larger than 1 μm and the maximum particle size of not larger than 3 μm , said heat treatment including maintaining said machine structural steel at a temperature ranging from 700 to 820 $^{\circ}\text{C}$, and cooling said machine structural steel to a temperature of 600 $^{\circ}\text{C}$ at a cooling rate of not higher than 20 $^{\circ}\text{C}$ per one hour.

6. Canceled

7. (Previously presented) A method of producing a high bearing pressure-resistant member, having a high machinability, said method comprising:

preparing a machine structural steel comprising carbon in an amount ranging from 0.15 to 0.25% by weight, silicon in an amount of not less than 0.4 % by weight and not more than 1.23 % by weight, nickel in an amount ranging from 1 to 3 % by weight, chromium in an amount ranging from 1.2 to 3.2 % by weight, and molybdenum in an amount ranging from 0.25 to 2.0 % by weight, a total amount of chromium and molybdenum amounting to at least 2.71% by weight;

applying a heat treatment for spheroidizing on said machine structural steel so that carbide is precipitated in said machine structural steel, the carbide having an average particle size of not larger than 1 μm and the maximum particle size of not larger than 3 μm , said heat treatment including maintaining said machine structural steel at a temperature ranging from 700 to 820 °C; and cooling said machine structural steel to a temperature of 600 °C at a cooling rate of not higher than 20 °C per one hour;

machining said machine structural steel to have predetermined shape and dimensions;
and

applying one of a first treatment and a second treatment on said machine structural steel after the machining, said first treatment including hardening said machine structural steel by carburizing, and tempering said hardened machine structural steel, said second treatment including hardening said machine structural steel by carbonitriding, and tempering said hardened machine structural steel.

8. (Previously presented) A member as claimed in claim 4, wherein the carbide contains at least one carbide selected from the group consisting of MC carbide, M_2C carbide, M_7C_3 carbide, M_{23}C_6 carbide, and M_6C carbide.

9. (Previously presented) A member as claimed in claim 4, wherein the member comprises a variable transmission member.

10. (Previously presented) A member as claimed in claim 4, wherein the member undergoes the first treatment.

11. (Previously presented) A member as claimed in claim 4, wherein the member undergoes the second treatment.
12. Canceled.
13. (Currently Amended) A method as claimed in claim 5 [6], wherein:
the carbide contains at least one carbide selected from the group consisting of MC carbide, M_2C carbide, M_7C_3 carbide, $M_{23}C_6$ carbide, and M_6C carbide; and
said machine structural steel has a Vickers hardness ranging from 180 to 250 after undergoing the spheroidizing heat treatment.
14. Canceled.
15. Canceled.
16. (Previously presented) A method as claimed in claim 7, wherein the carbide contains at least one carbide selected from the group consisting of MC carbide, M_2C carbide, M_7C_3 carbide, $M_{23}C_6$ carbide, and M_6C carbide.
17. (Previously presented) A method as claimed in claim 7, wherein the member comprises a variable transmission member.
18. (Previously presented) A method as claimed in claim 7, wherein the first treatment is applied on said machine structural steel.
19. (Previously presented) A method as claimed in claim 7, wherein the second treatment is applied on said machine structural steel.
20. (Previously presented) A steel for a high bearing pressure-resistant member, having a high machinability, said steel being formed of a machine structural steel comprising carbon in an amount ranging from 0.15 to 0.25% by weight, silicon in a relatively small

amount of not less than 0.4 % by weight, nickel in an amount ranging from 1 to 3 % by weight, chromium in an amount ranging from 1.2 to 3.2 % by weight, and molybdenum in an amount ranging from 0.25 to 2.0 % by weight, said machine structural steel containing carbide precipitated under a heat treatment for spheroidizing, wherein the total amount of chromium and molybdenum and the conditions of spheroidizing heat treatment are selected such that the carbide has an average particle size of not larger than 1 μm and a maximum particle size of not larger than 3 μm , wherein said heat treatment includes maintaining said machine structural steel at a temperature ranging from 700 to 820 °C, and cooling said machine structural steel to a temperature of 600 °C at a cooling rate of not higher than 20 °C per one hour.

21. (Previously presented) A steel as claimed in claim 20, wherein the total amount of chromium and molybdenum is within a range between 2.71 and 3.46 %.
22. (Previously presented) A steel as claimed in claim 1, wherein the total amount of chromium and molybdenum is within a range between 2.71 and 3.46 %.
23. (Previously presented) A member as claimed in claim 4, wherein the total amount of chromium and molybdenum is within a range between 2.71 and 3.46 %.
24. (Previously presented) A method as claimed in claim 5, wherein the total amount of chromium and molybdenum is within a range between 2.71 and 3.46 %.
25. (Previously presented) A method as claimed in claim 7, wherein the total amount of chromium and molybdenum is within a range between 2.71 and 3.46 %.
26. (Previously presented) A steel as claimed in claim 1, wherein said heat treatment is carried out prior to the steel undergoing a rough machining.
27. (Previously presented) A method as claimed in claim 5, wherein said heat treatment is carried out prior to the steel undergoing a rough machining.

28. (Previously presented) A method as claimed in claim 7, wherein said heat treatment for spheroidizing is carried out prior to the step of machining.